JOURNAL OF APPLIED BEHAVIOR ANALYSIS 1995, 28, 87–88 NUMBER 1 (SPRING 1995)

A COMPARISON OF PACING CONTINGENCIES IN CLASSES USING A PERSONALIZED SYSTEM OF INSTRUCTION

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This study compared the effects of multiple versus single deadline contingencies on distribution of unit-mastery test taking by students in four university classes taught using the personalized system of instruction. Rate of test taking was most uniform when multiple deadlines were imposed throughout the course. When deadlines were infrequent, a scalloped pattern of test taking developed.

DESCRIPTORS: pacing contingencies, personalized system of instruction, procrastination, university education

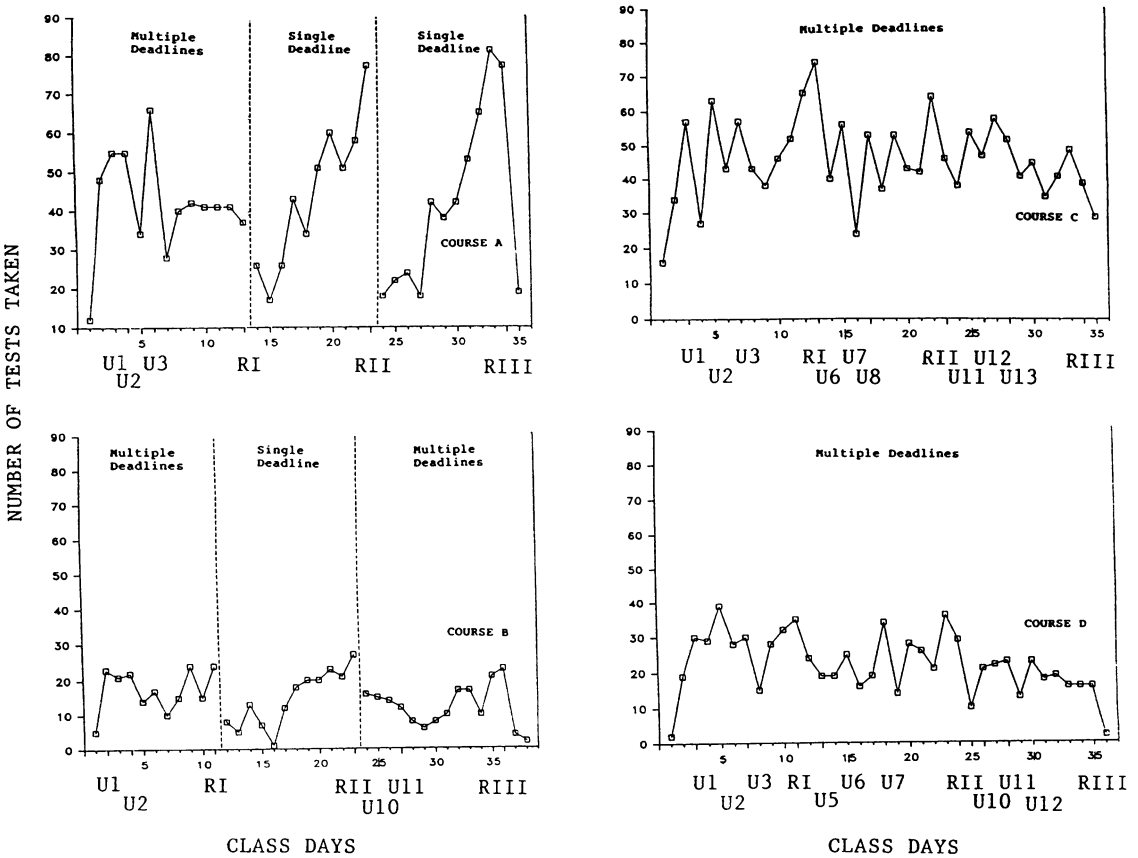
In courses using a personalized system of instruction (PSI), students often fail either to begin or to progress through the course material (Kulik, Kulik, & Carmichael, 1974). Contingencies that concentrate the student's effort near the end of the course create stress for the student, problems of class management, and most importantly, can be criticized as pedagogically unsound, given the merits of distributed versus massed practice on learning (e.g., Underwood & Ekstrand, 1966). The present study investigated the effectiveness of multiple versus single deadline contingencies in the form of penalties for late unit mastery in four classes taught using the PSI model. Penalty contingencies were manipulated across and within semesters; thus, a particular class was used as its own control. In the PSI literature, the use of bonus points for early responding is more common than the use of penalties for late responding, and control conditions are frequently lacking.

METHOD: Test taking of students at Brandon University in 13-week semester courses in Introduction to Behavior Modification (Courses A and C) and Advanced Behavior Modification (Courses B and D) was measured. The numbers of students enrolled in these courses were 81, 83, 30, and 46, respectively. The majority of students in Course B or D had completed Course A or C, respectively, in the previous term. The textbook material consisted of chapters 1 and 3 to 16 (15 units) for Courses A and C (Martin & Pear, 1988) and chapters 2 and 17 to 29 (14 units) for Courses B and D. The courses were conducted using a PSI model: Students worked independently, were required to take a test for each unit, and were required to demonstrate mastery of the material (as indicated by a test score of 80% or better) on each test before proceeding to the next unit. There were also three review tests for each course, scheduled after completion of approximately every one third of the units. Mastery on each review test was a prerequisite to proceeding to the subsequent unit test. If a student did not achieve the mastery criterion, he or she was required to repeat that unit or review test, using alternate forms of the test, until mastery was demonstrated. The test format was short answer. Each unit test consisted of five questions selected from the study questions at the end of each chapter. Each review test consisted of 10 questions selected from the study questions for the chapters concerned.

Students completed tests during class time. Tests were marked by the instructor or proctor, typically with the student present; this allowed the student to provide clarification when required and to receive immediate feedback on his or her test performance. Tests were scored using the answer key provided in the textbook's instructor's manual. In Courses A and C, a multiple-choice final exam written during the examination period, worth 25% of the course grade, was also required. In Courses B and D, there was no final examination. In Course A, deadlines were imposed for the first three unit tests only and for the three review tests. In Course B, test deadlines were introduced for Unit Tests 1, 2, 10, and 11 and for the three review tests. Thus, there were multiple deadlines in the first and last thirds of the course, but only a single deadline for the review test in the second third of the course. In Course C, deadlines were imposed for Unit Tests 1, 2, and 3, Review Test 1, Unit Tests 6, 7, and 8, Review Test 2, Unit Tests 11, 12, and 13, and Review Test 3. In Course D, deadlines were imposed for Unit Tests 1, 2, and 3, Review Test 1, Unit Tests 5, 6, and 7, Review Test 2, Unit Tests 10, 11, and 12, and Review Test 3. If a student had not mastered a particular unit test or review test by the deadline date, that student was credited with only 80% of his or her grade for that test when it was subsequently mastered.

RESULTS: The figure shows the total number of tests completed per day in each course, whether or not test performance reflected mastery. The single and multiple deadline contingencies employed were consistent with a variable-interval fixed-interval fixed-interval (VI FI FI) sequence of schedules in Course A, a VI FI VI sequence in Course B, and a VI schedule in Courses C and D. Test-taking performance corresponded to the schedule sequences described: Steadier responding and less pausing occurred during VI-like conditions, and a scalloped response pattern occurred during FI-like conditions. Rate of test taking was more uniform in the VI components of the VI FI FI sequence in Course A and the VI FI VI sequence in Course B than in the FI components, in which a very clear scalloped pattern of test taking developed. In Course B, the lower rates of test taking for Sessions 28 through 31 may have been due to severe weather conditions that precluded class attendance for many students. Rate of test taking showed the least variability during the VI schedules in Courses C and D, when multiple deadlines were imposed throughout the courses.

It can be argued that performance of students enrolled in Courses B and D was not influenced by prior performance in Courses A and C, given that test-taking behavior conformed to the schedule in effect, across conditions and across courses. Also, the final exam contingency in Courses A and C had little impact on performance. Patterns of performance in Courses A and C were distinct, corresponding to the contingencies in effect. Also, there was little difference between term test scores and final exam scores, suggesting that students did not differentially emphasize term work and the final exam.



The duration of a PSI course, in the purest sense, is limited only by the performance of the student. In the courses in this study, as in many applications of PSI, the duration of the course was time limited. In such cases, the self-pacing component may be problematic for at least some students, making the provision of additional time contingencies for unit mastery appropriate. This study showed empirically that in order to maintain test-taking behavior in PSI courses, test-taking contingencies must be imposed throughout time-limited courses. It is, however, possible at the same time to retain the self-paced feature that students favor in PSI courses (Kulik et al., 1974) by imposing deadlines for a majority of quizzes and tests, but not for all of them, and also by setting contingencies such that a deadline represents only the last date by which a particular test or quiz must be mastered.

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Portions of this paper were presented at the annual convention of the Association for Behavior Analysis, May 1991. Address correspondence to Linda L. Ross, Department of Psychology, Brandon University, Brandon, Manitoba R7A 6A9, Canada. Received October 7, 1993; final acceptance July 10, 1994; Action Editor, Brian Martens.